REMARKS

Reconsideration of the rejections stated in the Office action mailed September 1, 2006 is requested for the following reasons.

I. The premise of the rejections is incorrect

All the rejections are based on an incorrect premise, namely the position stated in the Office action that Buntin et al., U.S. Patent No. 3,849,241, "teaches making melt blown non-woven webs by extruding PET at a temperature of 550 F (288 C)" (Office action, page 2, second and third lines from the bottom, and page 7, third full paragraph). This position is understood to be derived especially from two paragraphs in Buntin, one called herein the "temperature-range" passage and found at column 3, lines 36-46, and a second, called herein the "polymer-list" passage, found in column 4, lines 34-42. But neither of these paragraphs, singly or in combination, nor any other disclosure in Buntin, supports the quoted position, as will be seen from the following discussion, beginning with a review of Buntin's disclosure.

A. Buntin's disclosure

Buntin, an early patent about meltblowing polymeric fibers, teaches the idea of heating a polymer to an elevated temperature to degrade it to a lower-viscosity form before it is meltblown. The two critical paragraphs identified above can be summarized as follows:

The "temperature-range" passage

The "temperature-range" passage, column 3, lines 36-46, teaches that the elevated temperature to which the polymer is heated to degrade it is

> well above the melting point of the polymer.

In further detail, Buntin teaches that the polymer is subjected to

> a temperature within the range of from about 550° F. [about 288 ° C] to about 900° F., preferably from about 600° F. to about 750° F.,

the length of the heating being

> for a period of time effective to cause the requisite extent of polymer degradation … ."

The "polymer-list" passage

One column after the temperature-range passage, at column 4, lines 34-42, Buntin describes the polymers that may be used in his invention, stating:

> The degraded fiber-forming thermoplastic resin … is produced … from thermoplastic polymer resins that are degradable …, including polyamides, e.g., … ; polyesters, e.g., poly(methymethacrylate) and poly(ethyleneterephthalate); polyvinyls, e.g., … ; C3-C8 polyolefins, high density polyethylene, and mixtures thereof.

The one-word mention of polyethylene terephthalate (PET) in the just-quoted disclosure is the only mention of PET in the whole 26-column patent.

B. Five facts disprove the quoted position in the Office action

Five facts may be cited to disprove the quoted position from the Office action (that Buntin "teaches making melt blown non-woven webs by extruding PET at a temperature of 550 F (288 C)").

Fact 1. Buntin's "temperature-range" and "polymer-list" passages do not teach specific temperatures at which PET should be treated

Nothing in the temperature-range passage at column 3, lines 36-46 states a particular temperature or temperature range for treating a particular polymer. Nor does anything in the polymer-list passage at column 4, lines 34-42 make such a teaching. The temperature-range passage simply talks about temperatures without referring to particular polymers. And the polymer-list passage simply talks about polymers without referring to particular temperatures. Neither passage refers to the other passage.

Particularly, nothing in the temperature-range passage suggests any particular temperature range for treating PET.

The quoted position from the Office action seems based on the idea that any one of the polymers listed in the polymer-list passage could be treated at any one of the temperatures of the temperature-range passage. But nothing in either passage makes such a teaching. And as stated in the following section, different polymers would necessarily be treated at different temperatures because of their different chemical composition.

Fact 2. Different polymers degrade at different temperatures

Persons skilled in the art would well understand that PET degrades at a limited range of temperatures different from the temperatures at which other polymers degrade. Chemical composition is known to affect the susceptibility of a polymer to degradation and the temperature at which the polymer degrades. See the attached extract from the *Encyclopedia of*

Polymer Chemistry, volume 4, pages 652-3 (Attachment M), showing in Tables 10 and 11 different susceptibility for different polymer compositions. Note that PET is more resistant than either polypropylene or polyethylene. For example, from Table 11, PET can be used in thinner thicknesses and at higher temperatures than polyethylene. And on page 653 in the first paragraph of the "Polyolefin" section it is stated that polypropylene is more susceptible than polyethylene, meaning that polypropylene degrades at even lower temperatures than those at which polyethylene degrades.

The above discussion illustrates what would be well understood by those skilled in the art: one temperature range does not apply to all polymers. Buntin's temperature-range passage describes a broad range, and persons skilled in the art would understand that particular polymers are necessarily treated at a limited range within Buntin's broad range. Nothing in Buntin suggests that all the polymers listed in the polymer-list passage will degrade at any and all the temperatures of the broad range in the temperature-range passage.

Fact 3. Buntin's requirement that the treatment temperature be "well above the melting point" means that PET could not be treated at 550° F

More than simply stating a temperature range, Buntin further requires that the treatment temperature be "well above the melting point" of the polymer being treated (col. 3, ll. 36-37). The need for such high temperatures follows from the fact that the goal of the treatment is to degrade the polymer, breaking it up into a lower-viscosity form.

Buntin's working examples provide a good indication of what is meant by "well above the melting point." The melting points for the two polymers that are exemplified in Buntin's examples – polypropylene and poly-4-methylpentene-1 – are listed in a table in the attached extract from the *Encyclopedia of Polymer Chemistry*, volume 8, page 26 (Attachment N), as follows:

Polypropylene	160-170° C
Poly-4-methylpentene-1	240° C

In Buntin's examples the extruder temperatures, which are the temperatures at which degradation is to occur (col. 9, ll. 18-19), are all above 580° F (about 304° C) for polypropylene, and above 620° F (about 326° C) for poly-4-methylpentene-1. These extruder temperatures are above the melting points for these two polymers by at least 86° C (for poly-4-methylpentene-1)

and 134-144° C (for polypropylene). In fact, most of Buntin's polypropylene working examples use extruder temperatures of at least 600° F (about 316° C) nearly 100° C above the melting point of polypropylene. Such temperatures provide an indication as to what Buntin means by "well above the melting point."

From the just-noted Volume 8, page 26 extract (Attachment N) from the *Encyclopedia of Polymer Chemistry*, it is seen that PET has a melting point of about 250-260° C. Using Buntin's smallest elevation above melting point, 86° C, as the amount of temperature elevation above PET's melting point, would make the treatment temperature for PET at least 336-346° C. More typically, the working examples in Buntin would suggest increases above melting point of at least 100° C above the melting point, meaning a treatment temperature for PET of at least 350-360° C.

These temperatures are far above the 295° C called for in applicants' broadest claim, meaning that on this ground alone Buntin does not anticipate applicants' invention.

Fact 4. <u>Buntin's requirement of treatment "for a period of time effective to cause the requisite extent of resin degradation" is opposite from applicants' invention</u>

Buntin's teaching that a polymer be heated "to cause the requisite extent of resin degradation" is not a teaching of applicants' invention, because Buntin's step of degrading a polymer does not coincide with, but instead is contrary to, the condition recited in both of applicants' independent claims 1 and 5, "to impart chain-extended crystallization to the PET fibers."

Buntin does not just teach a temperature range; he teaches using elevated temperatures applied for a time sufficient to degrade the treated polymer to a lower viscosity form. Applicants' purpose is completely different from Buntin's purpose. Applicants' purpose is to prepare meltblown PET fibers with a more fully developed molecular structure, that is, with a chain-extended crystal structure.

In order to develop chain-extended crystals, applicants <u>minimize</u> the temperature at which the molten PET polymer is extruded; applicants use "a temperature <u>lower</u> than conventionally used in meltblowing, … thereby <u>lowering</u> the temperature of the polymer as it exits the die orifice," whereby the point at which the polymer solidifies is brought closer to the

die (applicants' specification, page 9, lines 3-7; emphasis added). By contrast, Buntin increases the temperature high above the melting point in order to degrade the polymer.

Applicants' approach (minimizing temperature) and structural goal (increasing molecular structure in the form of chain-extended crystallization) are opposite from Buntin's. Persons skilled in the art trying to follow Buntin's instructions would be led away from applicants' invention.

Fact 5. Buntin's disclosure is not enabling as to PET

Buntin is mainly about polypropylene: polypropylene is repeatedly and prominently discussed in the patent; the "SUMMARY OF THE INVENTION" section at the beginning of the patent states that "Polypropylene is a preferred polymer"; and all 31 examples in the patent except Examples 20 and 21 are about polypropylene and Examples 20 and 21 are about a related hydrocarbon polyolefin.

Buntin's extensive discussions about polypropylene teach nothing about the conditions for treatment of PET. Polypropylene and PET are fundamentally different in polymer composition. PET has a repeating cyclical ring, and repeating ester groups, whereas polypropylene is a hydrocarbon. Such differences in polymer composition necessarily lead to different polymer degradation mechanisms and conditions.

Buntin teaches a broad range of conditions for his process – a range in treatment temperatures from 550 to 900° F and of air temperature from 500 to 900° F (col. 7, ll. 59-64). Buntin couples that broad range of temperatures with a broad range of polymers to be treated. Persons skilled in the art would understand that not all Buntin's stated temperatures are applicable to all Buntin's stated polymers. Different temperatures would necessarily be used with polymers of different composition.

Buntin has concentrated teachings about polypropylene, but essentially no teachings about PET. Assuming PET is treatable to achieve desired thermal degradation at all (which is not demonstrated in Buntin), the broad temperature ranges stated by Buntin are simply an invitation to a skilled worker to experiment. Buntin is not enabling with respect to PET, and an enabling disclosure is required for rejection under 35 USC 102(b) or 35 USC 103.

II. <u>Each of the rejections stated in the Office action should be withdrawn, because they are each based on the incorrect premise stated above</u>

A. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Buntin et al., U.S. Patent No. 3,849,241, based on a position that Buntin "teaches making melt blown non-woven webs by extruding PET at a temperature of 550 F (288 C)" (Office action, page 2, second and third lines from the bottom). As discussed above, Buntin does not anticipate applicants' claims 1-3 because

a) Buntin says nothing about treating PET at a temperature of 550° F (288° C), with an air temperature of 500° F (260° C);

b) Buntin leads away from treatment of PET at a temperature of 550° F (288° C) by calling for the treatment temperature to be "well above the melting point" and "effective to degrade the polymer";

c) persons skilled in the art would understand that different polymers degrade at different temperatures, and details about how to degrade PET would be required to teach treatment of PET; and

d) Buntin has no real teaching about how to use PET in Buntin's invention.

B. Claims 4-10 are rejected under 35 USC 103 in view of Buntin and various other references (pages 4-7 of the Office action).

All of these rejections depend on Buntin, and on the view that Buntin teaches the conditions recited in applicants' claims for melt-blowing PET. These rejections are all traversed because, as discussed above, Buntin has no enabling teaching pertinent to PET, the subject of applicants' claims, but instead leads away from the process steps recited in applicants' claims for treating PET.

C. Beginning on page 7, second full paragraph, the Office action states rejections against claims 1-10 based on an alleged admission made on behalf of applicants in a response for Application No. 09/716,790 received by the PTO on December 16, 2002. Whether or not the identified statements made on behalf of applicants qualify as an admission (the words "undoubtedly could be" do not specifically identify an item of prior art), the essential fact is that Buntin's teachings do not combine with the alleged admission (hereafter simply called "Admission") to teach or suggest applicants' invention.

The Office action (at page 8, first full paragraph) contends it would have been obvious "to make Applicant's admittedly known fiber into a web by using Butin's controllable variables within the PET web-making process in order to have a PET web process that successfully makes the known fibers into a web … ." Applicants understand this sentence as a contention that it would be obvious for Buntin to newly make fibers that correspond to those of the Admission, i.e., to make fibers by Buntin's procedures that would have the properties of the fibers of the Admission. Based on this contention the Office action states a rejection of claims 1-3 as unpatentable over Buntin in view of the Admission, and rejects remaining claims as unpatentable over Buntin, the Admission and other items of prior art.

A key part of all the stated rejections is the position represented by the statement on page 8, sixth line from the bottom, of the Office action that "Butin teaches the same process as applicant." This position is not correct, as discussed above. Buntin teaches a process for degrading polyolefins, especially polypropylene, not applicants' process for melt-blowing oriented PET fibers. The temperature ranges taught by Buntin are for degrading polypropylene, and persons skilled in the art would not associate them with PET, and would not regard them as a teaching of melt-blowing PET.

III. The responses to applicants' arguments in the Office action do not answer the above points

On pages 12-16 the Office action lists a summary of arguments used by applicants in their response filed June 21, 2006 and states responses to those arguments.

Essentially the responses in the Office action are based on the view discussed above, namely, that Buntin teaches treatment of PET at any and all of the temperatures within Buntin's broad temperature range of 550° F to 900° F (see Office action, page 14, lines 6-10).

Such a position is not taught in Buntin and is contrary to the well known understanding in the art that chemical composition affects susceptibility to thermal degradation. Some polymers will be immune to degradation at temperatures that will degrade other polymers.

It is simply not true that any one of the polymers listed by Buntin can be treated at any one of the temperatures within Buntin's stated temperature range. Buntin does not say they can, and the polymer industry would understand that they cannot. Buntin's separate disclosures of a temperature range in one paragraph and a list of polymers in a later paragraph do not mean that

the listed polymers may all be treated at any of the temperatures of the listed range. Specifically, Buntin does not say that PET is to be treated at a temperature of 550° F (288° C).

Further, Buntin states conditions in addition to a simple range of temperatures. The polymer is to be treated at a temperature "well above the melting point" and for a time "effective to cause the requisite extent of resin degradation." Neither of these conditions would be satisfied if PET were to be treated at 550° F (288° C) as proposed in the Office action.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

Respectfully submitted,

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